We claim:

1. A process for separating a mixture comprising

a) a monoolefinically unsaturated compound which is obtainable by adding two terminal olefins which bear the functional groups required to prepare the monoolefinically unsaturated compound comprising at least two functional groups, or a saturated compound obtained by hydrogenating such a compound,

b) a compound which is obtainable by adding more than two of the terminal olefins mentioned in a) or a compound obtained by hydrogenating such a compound,
and

c) a compound which comprises a transition metal, is homogeneous with respect to the mixture and is suitable as a catalyst for preparing a monoolefinically unsaturated compound by adding two terminal olefins which bear the functional groups required to prepare the monoolefinically unsaturated compound comprising at least two functional groups,

by means of a semipermeable membrane to obtain a permeate and a retentate in such a way that the weight ratio of component b) to component c) in the mixture fed to the semipermeable membrane is smaller than in the retentate,

wherein the compound a) used is a compound selected from the group consisting of adipic diester, adiponitrile, 5-cyanovaleric ester, 1,4-butenedinitrile, 5-cyanopentenoic ester and hexenedioic diester,
and
wherein the mean average pore size of the membrane is in the range from 0.9 to 50 nm in the case of inorganic membranes,
or
wherein the mean average separation limit of the membrane is in the range from 500 to 100000 daltons in the case of organic membranes.

2. The process according to claim 1, wherein the component c) used is a rhodium-, ruthenium-, palladium- or nickel-comprising compound.

3. The process according to claim 1, wherein the component c) used is a rhodium-comprising compound.

4. The process according to any of claims 1 to 3, wherein the component c) used is a rhodium-comprising compound which is homogeneous with respect to the mixture and is of the formula $[L^1RhL^2L^3R]^+X^-$ where

L^1 is an anionic pentahapto ligand;
L^2 is an uncharged 2-electron donor;
L^3 is an uncharged 2-electron donor;
R is selected from the group consisting of H, C_1-C_{10}-alkyl, C_6-C_{10}-aryl and C_7-C_{10}-aralkyl ligands;
X^- is an uncoordinating anion;

and where two or three of L^2, L^3 and R are optionally joined.

5. The process according to claim 4, wherein L^1 is pentamethylcyclopentadienyl.

6. The process according to either of claims 4 and 5, wherein X^- is selected from the group consisting of BF_4^-, $B(perfluorophenyl)_4^-$, $B(3,5\text{-}bis(trifluoromethyl)phenyl)_4^-$, $Al(OR^F)_4^-$ where R^F is identical or different fluorinated or perfluorinated aliphatic or aromatic radicals.

7. The process according to any of claims 4 to 6, wherein L^2 and L^3 are each independently selected from the group consisting of C_2H_4, $CH_2{=}CHCO_2Me$, $P(OMe)_3$ and $MeO_2C\text{-}(C_4H_6)\text{-}CO_2Me$.

8. The process according to any of claims 4 to 6, wherein L^2 and L^3 together are selected from the group consisting of acrylonitrile and 5-cyanopentenoic ester.

9. The process according to any of claims 4 to 7, wherein L^2 and R together are $-CH_2\text{-}CH_2CO_2Me$.

10. The process according to any of claims 4 to 7 or 9, wherein L^2, L^3 and R together are $MeO_2C(CH_2)_2\text{-}(CH)\text{-}(CH_2)CO_2Me$.

11. The process according to claim 3, wherein the component c) used is a compound selected from the group consisting of

$[Cp^*Rh(C_2H_4)_2H]^+ BF_4^-$,
$[Cp^*Rh(P(OMe)_3)(CH_2{=}CHCO_2Me)(Me)]^+ BF_4^-$,
$[Cp^*Rh(-CH_2\text{-}CH_2CO_2Me)(P(OMe)_3)]^+ BF_4^-$,

$[Cp^*Rh(MeO_2C(CH_2)_2\text{-}(CH\text{-})\text{-}(CH_2)CO_2Me)]^+ BF_4^-$,
$[Cp^*Rh(C_2H_4)_2H]^+$ B(3,5-bis(trifluoromethyl)phenyl)$_4^-$,
$[Cp^*Rh(P(OMe)_3)(CH_2{=}CHCO_2Me)(Me)]^+$ B(3,5-bis(trifluoromethyl)phenyl)$_4^-$,
$[Cp^*Rh(\text{-}CH_2\text{-}CH_2CO_2Me)(P(OMe)_3)]^+$ B(3,5-bis(trifluoromethyl)phenyl)$_4^-$,
$[Cp^*Rh(MeO_2C(CH_2)_2\text{-}(CH\text{-})\text{-}(CH_2)CO_2Me)]^+$ B(3,5-bis(trifluoromethyl)phenyl)$_4^-$,
$[Cp^*Rh(C_2H_4)_2H]^+$ B(perfluorophenyl)$_4^-$,
$[Cp^*Rh(P(OMe)_3)(CH_2{=}CHCO_2Me)(Me)]^+$ B(perfluorophenyl)$_4^-$,
$[Cp^*Rh(\text{-}CH_2\text{-}CH_2CO_2Me)(P(OMe)_3)]^+$ B(perfluorophenyl)$_4^-$ $[Cp^*Rh(MeO_2C(CH_2)_2\text{-}(CH\text{-})\text{-}(CH_2)CO_2Me)]^+$ B(perfluorophenyl)$_4^-$,
$[Cp^*Rh(C_2H_4)_2H]^+$ Al$(OR^F)_4^-$,
$[Cp^*Rh(P(OMe)_3)(CH_2{=}CHCO_2Me)(Me)]^+$ Al$(OR^F)_4^-$,
$[Cp^*Rh(\text{-}CH_2\text{-}CH_2CO_2Me)(P(OMe)_3)]^+$ Al$(OR^F)_4^-$ and
$[Cp^*Rh(MeO_2C(CH_2)_2\text{-}(CH\text{-})\text{-}(CH_2)CO_2Me)]^+$ Al$(OR^F)_4^-$,

where R^F is identical or different part-fluorinated or perfluorinated aliphatic or aromatic radicals.

12. The process according to any of claims 1 to 11, wherein a membrane which comprises substantially one or more organic or inorganic materials.

13. The process according to any of claims 1 to 12 wherein the ratio of the pressure on the retentate side of the membrane to the pressure on the permeate side of the membrane is in the range from 2 to 100.

14. The process according to any of claims 1 to 13, wherein a pressure in the range from 0.1 to 10 MPa is applied on the retentate side of the membrane.

15. The process according to any of claims 1 to 14, wherein a pressure in the range from 1 to 1000 kPa is applied on the permeate side of the membrane.

16. The process according to any of claims 1 to 15, wherein the membrane separation is carried out at a temperature in the range from 0 to 150°C.